CLAIMS

What is claimed is:

1. An isolated polynucleotide that encodes (1) a first polypeptide of at least 52 amino acids, the polypeptide having a sequence identity of at least 85% based on the Clustal method of alignment when compared to a second polypeptide selected from the group consisting of SEQ ID NOs:2, 4, 6, 8, 10, 12, 14, and 16, or (2) a third polypeptide of at least 100 amino acids, the polypeptide having a sequence identity of at least 85% based on the Clustal method of alignment when compared to a fourth polypeptide selected from the group consisting of SEQ ID NOs:18, 20, 22, 24, 26, 28, 30, and 32.

2. A polynucleotide sequence of Claim 1, wherein the sequence identity is at least 90%.

3. A polynucleotide sequence of Claim 1, wherein the sequence identity is at least 95%.

4. The polynucleotide of Claim 1 wherein the first is selected from the group consisting of SEQ ID NOs:2, 4, 6, 8, 10, 12, and 14, and the third polypeptide is selected from the group consisting of SEQ ID NOs:16, 18, 20, 22, 24, 26, 28, 30, and 32.

5. The polynucleotide of Claim 1, wherein the polynucleotide comprises a nucleotide sequence selected from the group consisting of SEQ ID NOs:1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, and 31.

6. The polynucleotide of Claim 1, wherein the first or third polypeptide is a biotin synthase.

7. An isolated complement of the polynucleotide of Claim 1, wherein
   (a) the complement and the polynucleotide consist of the same number of nucleotides, and
   (b) the nucleotide sequences of the complement and the polynucleotide have 100% complementarity.

8. An isolated nucleic acid molecule that
   (a) comprises at least 300 nucleotides and
   (b) remains hybridized with the isolated polynucleotide of Claim 1 under a wash condition of 0.1X SSC, 0.1% SDS, and 65°C.

9. A cell comprising the polynucleotide of Claim 1.

10. The cell of Claim 9, wherein the cell is selected from the group consisting of a yeast cell, a bacterial cell and a plant cell.

11. A transgenic plant comprising the polynucleotide of Claim 1.

12. A method for transforming a cell comprising introducing into a cell the polynucleotide of Claim 1.

13. A method for producing a transgenic plant, comprising

(a) transforming a plant cell with the polynucleotide of Claim 1, and

(b) regenerating a plant from the transformed plant cell.

14. A method for producing a nucleic acid molecule comprising

(a) selecting a polynucleotide of Claim 1, and

(b) synthesizing a nucleic acid molecule, containing the nucleotide sequence of the polynuclotide.

15. The method of Claim 14, wherein the nucleic acid molecule is produced *in vivo*.

16. An isolated polypeptide selected from the group consisting of (1) a first polypeptide of at least 52 amino acids, which has a sequence identity of at least 85% based on the Clustal method compared to an amino acid sequence selected from the group consisting of SEQ ID NOs:2, 4, 6, 8, 10, 12, 14, and 16; and (2) a second polypeptide of at least 100 amino acids, which has a sequence identity of at least 85% based on the Clustal method compared to an amino acid sequence selected from the group consisting of SEQ ID NOs:18, 20, 22, 24, 26, 28, 30, and 32.

17. The polypeptide of Claim 16, wherein the sequence identity is at least 90%.

18. The polypeptide of Claim 16, wherein the sequence identity is at least 95%.

19. The polypeptide of Claim 16, wherein the polypeptide has a sequence selected from the group consisting of SEQ ID NOs:2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, and 32.

20. The polypeptide of Claim 16, wherein the polypeptide is a biotin synthase.

21. A chimeric gene comprising the polynucleotide of Claim 6 operably linked to at least one suitable regulatory sequence.

22. A method for altering the level of biotin synthase expression in a host cell, the method comprising:

(a) transforming a host cell with the chimeric gene of Claim 21; and

(b) growing the transformed cell in step (a) under conditions suitable for the expression of the chimeric gene.

23. A method for evaluating a compound for its ability to inhibit the activity of a biotin synthase, the method comprising:

(a) transforming a host cell with a chimeric gene of Claim 21,

(b) growing the transformed host cell under conditions suitable for expression of the chimeric gene wherein expression of the chimeric gene results in production of the biotin synthase;

(c) optionally purifying the biotin synthase polypeptide expressed by the transformed host cell;

(d) treating the biotin synthase polypeptide with a compound to be tested; and

(e) comparing the activity of the biotin synthase polypeptide that has been treated with the test compound to the activity of an untreated biotin synthase polypeptide, thereby selecting compounds having inhibitory activity.